

What is claimed is:

1. A method of preserving a biopharmaceutical product comprising:

placing a medium comprising a biopharmaceutical product into a vessel having an interior cavity defined by at least an interior wall of said vessel;

actively cooling said interior wall using a fluid;

actively cooling a heat exchange structure within said cavity by flowing a fluid through a dual flow conduit having one or more heat transfer members thermally coupled thereto;

freezing said medium within said vessel to preserve said biopharmaceutical product.

2. The method of claim 1, wherein said dual flow conduit comprises a core member defining an interior passage adapted to receive a fluid and an outer member spaced from the core member and defining an outer passage with the core member, wherein the inner and outer passages are in fluid communication with each other to define a flow path for a fluid.

3. The method of claim 2, further comprising directing fluid down the interior passage and up the outer passage.

4. The method of claim 1, wherein said dual flow conduit is centrally located within said interior cavity.

5. The method of claim 1, wherein said structure is removably mounted within said interior cavity of said vessel.

6. The method of claim 1, wherein said one or more heat transfer members are fins.

7. The method of claim 6, wherein said fins extend radially outward from said dual flow conduit.

8. The method of claim 7, wherein said fins are configured symmetrically around said dual flow conduit to form substantially similar compartments within said interior cavity.

9. An apparatus for preserving a biopharmaceutical product comprising:

a vessel adapted to receive a medium comprising a biopharmaceutical product, said vessel having an interior cavity defined by, at least, an interior wall of said vessel, said interior wall adapted to be actively cooled using a fluid;

a heat exchange structure being positioned within said cavity having one or more heat transfer members thermally coupled thereto, said heat exchange structure comprising a dual flow conduit adapted to be actively cooled using a fluid.

10. The apparatus of claim 10, wherein said dual flow conduit comprises a core member defining an interior passage

adapted to receive a fluid and an outer member spaced from the core member and defining an outer passage with the core member, wherein the inner and outer passages are in fluid communication with each other to define a flow path for a fluid.

11. The apparatus of claim 10, wherein fluid is directed down the interior passage and up the outer passage.

12. The apparatus of claim 10, wherein said core member and said outer member are tubular.

13. The apparatus of claim 9, wherein said heat exchange structure is removably mounted within said cavity.

14. The apparatus of claim 9, wherein said one or more of said heat transfer members are fins.

15. The apparatus of claim 14, wherein said fins are configured to form freezing compartments in said interior cavity.

16. The apparatus of claim 10, wherein said outer member comprises an end piece adapted to receive fluid flowing through the interior passage defined by said core member.

17. The apparatus of claim 16, wherein said end piece includes a heat exchange member.

18. The apparatus of claim 17, wherein said heat exchange member of said end piece extends towards said interior wall.

19. The apparatus of claim 9, wherein said one or more of said heat transfer members extend radially from said heat exchange structure.

20. The apparatus of claim 9, wherein said dual flow conduct is positioned in the center of said vessel.

21. The apparatus of claim 9, wherein said heat exchange structure includes a plurality of heat transfer members configured to form freezing compartments within said interior cavity.

22. The apparatus of claim 9, wherein said interior wall includes one or more heat transfer members extending towards said structure.

23. The apparatus of claim 22, wherein said one or more

heat transfer members extending from said interior wall extend towards said one or more heat transfer members of said heat exchange structure.

24. The apparatus of claim 9, wherein said dual flow conduit promotes bottom to top freezing.

25. An apparatus for processing a biopharmaceutical product comprising:

a vessel adapted to receive a medium comprising a biopharmaceutical product, said vessel having an interior wall defining an interior cavity, said interior wall adapted to be actively cooled using a fluid;

a plurality of heat exchange structures within said interior cavity, at least one of said plurality of heat exchange structures comprising a dual flow conduit adapted to be actively cooled using a fluid, wherein at least one of said plurality of heat exchange structures comprises one or more heat transfer members.

26. The apparatus of claim 25, wherein said dual flow conduit comprises a core member defining an interior passage adapted to receive a fluid and an outer member spaced from the core member and defining an outer passage with the core member, wherein the inner and outer passages are in fluid communication with each other to define a flow path for a fluid.

